

Federation of Earth Science Information Partners Partnership Application

Please complete all sections to the fullest extent possible and forward completed application to: Carol Meyer, carol.meyer@earthsciencefoundation.org. If you have any questions, please contact her at 877.870.3747.

I. CONTACT INFORMATION

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II. ABOUT YOUR ORGANIZATION

A. ORGANIZATION/DIVISION/PROJECT NAME:

National Ecological Observatory Network (NEON), Inc.

B. OVERVIEW OF YOUR PRIMARY ACTIVITIES in regards to the Earth Sciences Community (200 words or less)

The National Ecological Observatory Network (NEON), or the Observatory, is a NSF funded national investment in physical and information infrastructure. NEON, Inc. is a 501c(3) corporation charged with building and operating the Observatory. The Observatory's goal is to enable understanding and forecasting of the impacts of climate change, land use change and invasive species on continental-scale ecology by providing physical and information infrastructure to support research, education and environmental management in these areas. NEON provides data and information to scientists, educators, decision makers and the general public on how land use, climate change and invasive species affect biodiversity, disease ecology, and ecosystem processes. NEON is a continental scale system that will collect consistent, calibrated data from 60 sites in the continental US, Alaska, Hawaii, and Puerto Rico over 30 years. The Observatory will produce basic calibrated data and synthetic products. NEON data products will be freely and openly available to scientists, educators, students, decision makers, and the public. The NEON infrastructure is a means to enable transformational science and to promote broad ecological literacy.

C. Please list and briefly describe the primary product(s) or service(s) that your organization provides (will provide) to the Earth Sciences community.

NEON's physical and information infrastructure is intended for use by the community to support and advance science, education, and environmental management. NEON information will be made available to the scientific community, students, educators, decision makers and the public through the NEON cyberinfrastructure (CI). NEON serves to the public data and information across seven NEON challenge themes (Biogeochemistry, Biodiversity, Climate change, Ecohydrology, Infectious disease, Land use , Invasive species) as a foundation to detect and quantify ecological responses to climate, land use and biological invasion and to establish the link between ecological cause and effect. NEON high-level data products should enable ecological forecasts and analyses at a continental scale and facilitate the observation of decadal scale changes against a background of seasonal-to-interannual variability. The data products have been chosen to maximize utility to the community and to enable analysis of cause and effect in ecosystems and forecasting of the future states of ecosystems.

D. Please give a main website address for the proposed Partnership:

Web Address: <http://www.neoninc.org>

III. HOW YOUR ORGANIZATION WILL BENEFIT FROM/CONTRIBUTE TO THE EARTH SCIENCE INFORMATION PARTNERS (ESIP) FEDERATION

- A. Describe current or anticipated users of your products and services and how you think the Federation can help you better serve this population. (200 words or less)

The Observatory is intended to support the community in advancing the frontier of ecological theory. NEON's information infrastructure provides consistent, long-term, large-scale data sets available freely over the web for science, education, and decision-support purposes. The CI ingests data from the Observatory platform, archives the raw data, and runs the data through algorithms before they are published freely over the web for public use. Geospatial data will be available in standard sized grids and projections, data products will be qualified with appropriate metadata, the algorithms and algorithm documentation used in the computation of those products will be accessible, as well as the protocols used in the field acquisition of primary observations used for computation of derived data products. We see the Federation as an effective forum for obtaining feedback on the technical approaches for creating, archiving, and supplying these products in a manner consistent with community best-practices. We recognize the importance of supplying our data products in a manner that is usable on the technical platforms that are commonly used to query, ingest, and process earth science / environmental science data.

- B. Describe any Earth science technologies that you have developed and are willing to bring to the Federation's efforts to provide best-practices. (200 words or less)

One of NEON's priorities that has shaped our construction proposal (approved by the National Science Board – the governing body of the National Science Foundation) is the delivery of a physical and information infrastructure that is robust but yet adaptable to evolving needs. This includes the implementation of a production-quality CI designed for high throughput and uptime to deliver more than 700 data products to support research, education and environmental management. The CI is designed with those criteria first and foremost, and in designing our information infrastructure, we carefully consider both COTS as well as community-supported open-source approaches, keeping in mind the challenges involved in creating a robust end-to-end architecture as part of the systems integration effort. NEON stands-up Technical Working Groups (TWGs) comprising representatives from outside NEON to provide guidance and recommendations in support of scientific and technical requirements. TWGs are one of the mechanisms by which NEON stays informed of community needs and initiatives. We fully intend to be reciprocal in this relationship and make our designs (for the NEON physical field infrastructure, CI, and our scientific protocols [field, QA/QC, cal/val, etc]) open and accessible to the community at a relevant juncture once the designs have been tested and verified during construction.

- C. Describe how your proposed membership would contribute to the efforts and the mission of one or more standing committees, working groups and/or clusters. See Page 3 for descriptions of the different activities of the various standing committees, working groups, and clusters. (200 words or less)

NEON's Enterprise Strategy as we have stated to US Congressional committees comprises the following six elements: Interoperability (NEON is working closely with Federal and NGO partners on protocols, standards and metadata to ensure that NEON data complement existing operational systems), Research to Operations (NEON is developing formal agreements to allow

Federal agencies to not only access NEON data for operational use but to use the observatory as a test-bed for critical new inventory and monitoring variables), Open Data (All NEON data will be free and openly available for research, education and decision support), Open Observation Infrastructure (the Observatory is designed to serve as a platform for additional observations, experiments and research projects), Forecasting (NEON data have been selected to enable advanced ecological forecasting models: NEON is working with USGS, NASA and other agencies to advance ecological forecasting), and Public Engagement (NEON emphasizes producing usable information for students, teachers and citizens and views communicating scientific data and information as a priority). These stated strategies are consistent and aligned with the ESIP active standing committees (education, IT and interoperability, and products and services). NEON also stands-up technical working groups comprising community experts (including those from ESIP member institutions) that span at least five of the seven clusters.

D. Describe your own use of Earth science information and data and how you would see this use enhanced by your partnership in the Federation. (200 words or less)

NEON adopts the CODMAC definition of data levels. Data products for NEON levels 0 through 3 are derived primarily from a single instrument or observer, while Level 4 data generally combine information from more than one instrument, observer, or sampling sites. NEON has already recruited term-based scientists to implement continental-scale terrestrial biophysical process models on the NEON CI. NEON is also constructing three airborne observation platforms each comprising a full waveform LiDAR and a high-resolution spectrometer. We anticipate recruiting members of the earth sciences community to work on the documentation, implementation, and review of remote sensing algorithms. Because NASA's planned Hypersi utilizes a spectrometer with similar bandwidth and performance characteristics, we anticipate a suite of collaborative activities on cal/val protocols and information retrieval algorithms. We also foresee similar contributions to other relevant NASA Earth Science missions. NEON is already utilizing MODIS, AVIRIS, and Hyperion (USGS EO-1) data in design and prototype activities.

NEON is close to completing MOUs with the US Department of the Interior and NOAA NCDC to facilitate collaborative activities that promote interoperability in observation methodologies and informatics. NEON is also currently working on a MOU with the EPA with a similar framework and intent, and has also been in active discussions with the USDA about how observations can be extended to meet agricultural requirements.

Interoperability is essential to facilitate the transition of research capabilities into operational utility. There is clear and unambiguous interest from NEON's Federal partners in adopting NEON relevant technology, and a recognition by NEON that we need to be aware of interoperability best practices that are being adopted by our partners. Membership in the Federation would greatly facilitate NEON personnel's ability to contribute to such efforts.

IV. YOUR CHOICE OF MEMBERSHIP TYPE. PLEASE PICK ONE.

ESIP-I (primarily a data center/archive) ☒

ESIP-II (primarily a research center) ☐

ESIP-III (primarily applications and education) ☐

ESIP-IV (primarily a sponsoring member) ☐

V. Any other comments about your proposed membership and its relation to the Federation that you wish to provide.

Thank you for your application for partnership in the ESIP Federation.

List of Federation Committees and Clusters

Administrative Committees

Executive Committee: Comprised of all standing and administrative committee chairs, ESIP Type Representatives, the President and Vice President of the Federation. Oversight body for most day-to-day activities of the Federation, acts on behalf of the Assembly between meetings.

Constitution and Bylaws: Provides counsel on matters related to the constitution and bylaws and other related issues (e.g. amendments to government documents)

Finance and Appropriations: Oversees financial resources of the Federation, including the annual budgeting process.

Partnership: Reviews and processes all applications for membership before making applications available for review by members of the Federation. Deals with other membership-related issues.

Standing Committees:

Commercial Development: Promotes a forum wherein commercial development of Earth science information can be fostered. (inactive)

Community Engagement: Provides a forum for the Federation to promote partner products and to engage new users for data products and services. (inactive)

Education: Provides a forum to make accessible to educators and learners at all levels in both formal and informal educational contexts the Earth science data, information, tools, and curricula available within the ESIP Federation.

Information Technology and Interoperability: Provides a forum for discussing information technology and interoperability issues of the Earth science community and serves as a central point for activities in this realm.

Products and Services: Provides a forum for defining best practices and defining requirements for earth science products and services. Currently is involved in developing an inventory of partner products and services.

Clusters (presently active, April 2009):

Web Services
Semantic Web
Data Preservation and Stewardship
Decisions
Air Quality
Federated Search
Water